

## ABSTRACT

An improved wavefront sensor for characterizing phase distortions in incident light including optical elements that spatially sample the incident light and form a dispersed spot with a fringe pattern corresponding to samples of the incident light. An imaging device captures an image of the dispersed spot with said fringe pattern formed by said optical elements. And an image processor that analyzes the spectral components of the fringe pattern of a given dispersed spot to derive a measure of the local phase distortion without ambiguity in the corresponding sample of incident light. The optical elements may comprise refractive elements, diffractive elements or a combination thereof (such as a grism). The wavefront sensor may be part of an adaptive optic system (such as a large-aperture space telescope) to enable the measurement and correction of large phase steps across adjacent mirror segments of a deformable mirror.